

N°1104 / PC

TOPIC(s) : Synthetic biology, metabolic engineering / Industrial biocatalysis

Discovery of polystyrene biodegradable bacteria from the soil and its application for the polystyrene biodecomposition

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PURPOSE OF THE ABSTRACT

Polystyrene (PS), the sixth type of plastics, is difficult to biodegrade due to its chemical structure, which has phenyl moieties attached to linear alkanes. We isolated a putative PS eating bacteria (*Pseudomonas* sp.) from the soil, which can biodegrade PS. To investigate biodegradation of PS, isolated *Pseudomonas* sp. was incubated in non-carbonaceous nutrient medium (M9 medium) with PS as the only carbon source. Growth rate of isolated *Pseudomonas* sp. increased with increasing the concentration of PS. Biodegradation of PS by isolated *Pseudomonas* sp. was conducted by fourier transform infrared spectroscopy (FT-IR), scanning electron microscope analysis (SEM), and water contact angle measurement (WCA) to confirm the PS chemical structure changes, biodegradation of PS-film, and increasing hydrophilicity of PS-film, respectively. These results provide significant insights into the discovery of a new type of *Pseudomonas* sp. for the biodegradation of PS, as well as its potential as PS eating bacteria.

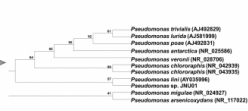
This study supported from National Research Foundation grant (NRF-2022R1C1C2003774, NRF-2022M3J5A1056169, NRF-2022M3J5A1085239; and Projects 1711195195 and RS-2023-00208002) funded by the Korean Ministry of Science and ICT.

FIGURE 1

Process of screening samples and Phylogenetic tree

The screening process of PS-biodegrading microorganisms from soil (left) and Based on 16S rRNA gene sequences, showing bacterial populations present in *Pseudomonas* sp. JNU01 (right)

FIGURE 2



KEYWORDS

Polystyrene | Biodegradation | *Pseudomonas* sp. | Synthetic plastic eating bacteria

BIBLIOGRAPHY